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Theoretical article

ANXIETY AS CONSEQUENCE FROM E-LEARNING IN HIGH SCHOOL STUDENTS WITH SPECIAL EDUCATIONAL NEEDS – LITERATURE REVIEW

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Abstract
The present literature review aims to investigate the so far research results regarding anxiety as consequence from e-learning in high school students with special educational needs. The results revealed that not many comparative studies have been implemented for e-learning in the age category of high school students, regarding students with and without special educational needs, while most studies are about college students of higher education. The few available data indicate that high school students with special educational needs have more e-learning issues, higher levels of anxiety, stress, and depression, lower levels of well-being, and worse attention span, spontaneous commitment, and autonomy, than students of typical growth.

***Key words**:Anxiety, Special Educational Needs, E-Learning*

Introduction

Children and adolescents are often report somatic complaints for which no medical cause can be identified. These symptoms are common in anxiety (Allison et al., 2014). Researchers and clinicians are becoming increasingly conscious of the importance of anxiety disorders in adolescents in terms of negative social and academic outcomes, as well as the likelihood of retention into adulthood (Spence et al., 2003).

Recently another stressor was added unexpectedly to students' life: that of the COVID-19 pandemic. The conditions were such that the functioning of education worldwide has been dramatically affected by the pandemic. Specifically, the COVID-19 outbreak has impacted the education of over a billion students in 137 nations around the world (UNESCO, 2020). Physical distances measures forced educational institution to implement online distance courses within a very short time (Duraku & Hoxha, 2020), and not always well-planned (Aguilera-Hermida, 2020). Students all over the world had no choice but to cope with the change and embrace the usage of e-learning systems to deal with the shifts in their learning modalities (Nikou & Maslov, 2021). One of the many questions that arise, however, is how students with special educational needs experienced this change.

It is well known that e-learning may be difficult for students with special educational needs and disabilities (Fichten et al., 2009; Catalano, 2014; Richardson, 2014). Especially during the pandemic COVID-19, special educators encountered several obstacles, including equity issues for students, virtual teaching, and providing special education services (Smith, 2020). Moreover, literature shows that e-learning is usually a source of anxiety, even for typically developed students (e.g. Tuncay & Uzunboylu, 2010; Pavlakis & Kaitelidou, 2012; Saadé et al., 2017; Cadamuro et al., 2021).

Anxiety in students

In general, anxiety is: '*a biological warning mechanism with intense feelings of fear that prepares us for action*' (Al-Biltagi & Sarhan, 2016: 18). Anxiety is an unpleasant emotional state that includes feelings of tension, fear, or even behavior in response to a danger whose source is largely unknown or unrecognizable (Mitrousi et al., 2013). Another term that is often confused with anxiety is stress. Stress is 'an imbalance between demands placed on us and our ability to manage them' (Adamsson & Bernhardsson, 2018: 173). In other words, stress is considered as a person's emotional and physical reaction to tough or demanding conditions (Dobson, 2012). There are generally three types of anxiety: a) trait anxiety, which is a general personality trait, b) state anxiety, which includes transient emotional states that vary over time and vary in intensity, and c) concept-specific anxiety, which is associated with a specific situation (Saadé et al., 2013).

Fear is a normal reaction at each developmental stage of the child and is a part of human self-protection system (Al-Biltagi & Sarhan, 2016). Therefore, there are some acceptable levels of anxiety and fear, depending on the developmental stage, beyond which a pathological condition occurs particularly when anxiety interferes with functioning. Children suffering from anxiety disorders have a low quality of life, which is evident across all forms of anxiety disorders (Al-Biltagi & Sarhan, 2016). Anxious students often have poor study habits and they also have difficulties in organizing the material, resulting in insufficient processing of the information presented to them during lessons (Wigfield & Eccles, 1989). Monga et al. (2000), claim that because anxious children do not exhibit the same sorts of overt behavioral challenges as children with externalizing disorders, they are frequently overlooked and misdiagnosed. Birmaher et al. (1999) also support the view that anxiety disorders in children are underdiagnosed and undertreated because they are commonly accompanied by other mental diseases (e.g., severe depression, bipolar disorder) that may hide the existence of an underlying anxiety disorder, and because these individuals typically do not exhibit behavioral issues.

Anxiety in children is usually related to school. Students, according to the Attribution theory, need to feel in control of the result of an academic assignment. Students who feel more in command of the result will be more motivated to accomplish the activity (Lim, 2007). There are definitely many situations in school life that can cause justified stress in children. Such sources of stress are: the daily routines of the school, the stress of the exams, the failure in the lessons, the bad relations with the teacher and the classmates, the excessive pressures and expectations of the parents, the learning difficulties etc. (Herbert, 1997). Hence, school environment is crucial because there are several factors that can be linked to students' anxiety, such as teachers' interactions with students and the classroom environment (Wigfield & Eccles, 1989).

The concept of e-learning

In the knowledge society, education is becoming highly significant, giving rise to new concepts in the fields of learning and teaching (Kahiigi et al., 2008). The Internet has long been acknowledged as a means of providing education, material, and learning in numerous fields as the usage of networked computers and advancements in communications technology have increased (Zhang, & Nunamaker, 2003). The popularity of the Internet, as well as substantial advancements in communication technology in recent years, have provided enormous potential in learning and education through 'online learning' or 'electronic learning', in brief 'e-learning' (Gunasekaran et al., 2002; Sunkara & Kurra, 2017). Incorporating technology into the classroom has opened up new possibilities for involvement in both teaching and learning (Kahiigi et al., 2008). The primary distinction between e-learning and traditional classroom teaching is that e-learning makes use of network infrastructures to facilitate the learning process (Wan et al., 2008). So, the medium through which education is given is the key difference between an e-learning and a traditional face-to-face classroom.

From the learner's standpoint, e-learning means more freedom from time and location restrictions, as well as increased access to more possibilities for continuing education. From the standpoint of an educational establishment, it can eliminate spatial and perhaps even political impediments to enrollment,

permitting lessons to be offered on a larger scale or in a more efficient manner. Moreover, e-learning from a regional point of view, would imply broadening the number of learners as well as providing learning chances for those who live far away from educational institutions, notably without the requirement for additional local labor, new structures or infrastructure (Al -Qahtani & H
So, the benefits of learning are the following: a) flexibility; b) savings of cost and time; c) self-paced and tailored-to-me education; d) teaching environment that encourages collaboration; e) accessibility to the teachers; and f) unrestricted access to educational material.

The COVID-19 pandemic has forced millions of students and educators to adapt directly – with no other choice available – to e-learning. This, of course, did not happen without consequences. Wiederhold (2020) uses the phrase 'Zoom fatigue' in order to describe: exhaustion, anxiety, or concern as a result of excessive use of virtual teleconference system. Although this phenomenon affects all users of such platforms, students should definitely be included in this phenomenon as they were forced to attend many hours of classes daily on such platforms.

But also, before COVID-19 pandemic, researchers have highlighted some negative effects of e-learning. For example, loneliness and a lack of actual social engagement is two basic negative effects of e-learning. This can also negatively affect student's communication abilities. In regards to aspects of the educational process, for example explanation, e-learning may become less successful, as explanation may be simpler in face-to-face meetings. Furthermore, e-learning may lack the assistance offered by nonverbal signals or observation of others' interactions (Al -Qahtani & Higgins, 2013).

Moreover, there are some physical issues related to e-learning. For example, Computer Vision Syndrome is a set of visual symptoms caused by computer use. Some of these symptoms are: headache, eye tiredness, burning feeling, inflammation of the eyes, neck and shoulder pain. Musculoskeletal disorders are also often to students of e-learning. Prolonged computer usage with minimal rest intervals is a risk factor for the development of musculoskeletal disorders of the shoulder, elbow, and wrist/hand (Tze et al., 2020).

E-learning and students with special educational needs

Individuals with disabilities may now perform activities that were previously difficult or even unfeasible as a result of the increasing use of information and communication technology in most areas of society and recent breakthroughs in adapted hardware and software. So, students with a variety of disabilities can benefit from e-learning (Fichten et al., 2009). People with disabilities who would find it difficult to travel to or navigate a school, or who would find sitting in a classroom difficult, can take advantage of online education. Distance learning allows these persons to overcome the isolation that people who are disabled experience in their lives and to reclaim a social identity, but all of this does not happen overnight. Individuals with such difficulties require additional attention and easier access to all educational instruments available in order to meet their needs (Jain et al., 2014).

In fact, e-learning may be difficult for students with specific educational needs and disabilities (Fichten et al., 2009; Catalano, 2014). One of the most important challenges of e-learning for students with disabilities is the lack of or very limited sociability. Online education can uniquely foster the improvement of social competence in students by allowing them to potentiate rather than exacerbate individual students' weaknesses; however, as with all students, it may be contingent on personal characteristics, which differ greatly among students with disabilities. While the issues in this area relate to teacher mediation, training, accessibility of learning virtual environments, and technology control by instructors and students, online education may also help the educational inclusion of students with disabilities. Online and remote communication, as well as learning, on the other hand, are artificial by design and cannot give all of the advantages and benefits that physical contact and relationships with peers and teachers bring to children and students with disabilities (Šćepanović & Nikolić, 2020).

In fact, studies show complex differences between students with disabilities and non-disabled learners. For example, research conducted among college students with disabilities by Fichten et al. (2009), illustrates that e-learning has numerous advantages, such as the availability of online course notes, but it also has drawbacks. The lack of access of websites and course management systems is at the top of the problem list.

Richardson (2014) studied the academic success and performance of college students with disabilities in distance education, finding that students with disabilities had lower course attendance, pass rates, and scores than nondisabled students. Richardson also found differences between students with different disabilities. Moreover, older students, women and students who received financial assistance had better course completion, pass rates, and grades. Specifically, students with hearing difficulties (Richardson, 2015) were more likely than nondisabled students to finish their courses. Moreover, it was equally likely for students with hearing problems to pass the courses and get good grades as nondisabled students. Similarly, students with autism spectrum disorders (Richardson, 2017) are equally likely to complete and pass the courses, and to get good grades as nondisabled students. But the results are different when there are additional disabilities (Richardson, 2015; 2017).

Cole (2019) studied the online course experiences of postgraduate students with physical challenges. Study's results showed that physical disabilities lead to barriers in self-regulation, pressure to overachieve, isolation, and miscommunication. However, if they experience a proper designed online course, they benefit in self-regulating themselves, increased confidence and pride, resilience, social connection, constructive dialogues, and defense about themselves and other people.

There are also several studies conducted during the pandemic COVID-19, while special educators encountered several obstacles, including equity issues for students, virtual teaching, and providing special education services (Smith, 2020). For example, Zhang et al. (2020) investigated the pandemic's influence on students of higher education with disabilities. They found that students with disabilities were more apprehensive than their peers who did not have difficulties about their lessons becoming online. Furthermore, as compared to their counterparts without impairments, students with disabilities reported having faced more COVID-19-related challenges. The authors claim that students with disabilities in higher education want assurances about the accessibility of online learning technologies, which are becoming more common in higher education not only as a result of COVID-19 but also more broadly. Furthermore, educational technologies that respect the learning context and are designed to create a helpful, tranquil, and connected learning environment will be more accessible.

Scott and Aquino (2020) found that transitioning to remote education has been problematic for college students with impairments in a variety of ways. In virtually every case, these hurdles have been found to have caused more frequent difficulties for students with disabilities than for the general student population. Documenting a disability and addressing new access restrictions and remedies were two of the most pressing concerns. Transitioning to remote operations has been difficult for professionals dealing with students with disabilities, with the most difficulties noted in acquiring technical help and talking with professors on accessible course design.

Šćepanović and Nikolić (2020) studied the perspectives of parents and teachers of children with disabilities on distance education during the pandemic. The findings demonstrate that the majority of respondents, with a substantial difference between teacher and parent groups, believe that online learning is not a good substitute for actual learning, but that it can be beneficial to children with disabilities in some ways. Furthermore, the majority of respondents believed that students with impairments cannot study online without considerable assistance.

Dianito et al. (2021) attempted to investigate the college students with disabilities' experiences while online courses during COVID-19 pandemic. The majority of the participants stated that they often had difficulty articulating and addressing their individual requirements to instructors and classmates. The majority of students with disabilities believed that attending an inclusive school was impossible. One thing that all of the participants had in common was a sense of exclusion. Each participant's tale on how

exclusion frequently led to prejudice and stereotypes reflected this sentiment. Furthermore, students with disabilities had difficulty adjusting to the online class when it first started. The participants had a difficult time adjusting to the new normal and new learning methods due to the transfer from face-to-face to online courses. Most of the participants, especially those who were visually challenged, failed at first to grasp how to use technical gadgets. It was also clear that some of the participants were having difficulty adjusting to mainstream school, which teaches in a totally different way than special education.

Gin et al. (2021) examined how college students with disabilities were affected by the fast shift to online learning during the COVID-19 outbreak. Students were unable to use previously established adjustments such as reduced-distraction testing and note-takers, according to the researchers. They also discovered that the online learning environment caused new obstacles for students with impairments, which may have been minimized by the use of adaptations.

Anxiety in e-learning

The use of technology can have undesirable side effects, such as powerful, negative emotional states that develop not just during engagement but even before the contact begins, when the concept of needing to connect with the computer arises. Tension, bewilderment, anger, worry, and other negative emotions can have an impact on not just the encounter but also performance, learning, social connections, and general well-being (Saadé & Kira, 2009). These negative emotional states can be referred to as ‘general anxiety’ in relation to e-learning settings (Saadé et al., 2013). Anxiety is a part of any new academic experience (maybe any new experience), and it is amplified when the learning takes place online (Mathew, 2014). Saadé et al. (2017:148) define anxiety in online learning as: ‘a feeling of fear from misuse of information technology compromising course performance’. So, in this case anxiety is related specifically with school performance.

Students' mental health suffers as a result of increased anxiety derived from e-learning. These are due to increased demand for new technological capabilities, higher efficiency, and information overload (Alibudbud, 2021). Scholars differentiate four forms of anxiety associated with learning/teaching online: anxiety over computers, language, social situations, and tests (Goncharova et al., 2022). Clearly, aspects such as the context in which a person was first introduced to the computer, previous failures and successes, and current activities being attempted, including the use of a new software program or a learning management system, are all indicators of the person's state and type of anxiety (Saadé et al., 2013).

Literature shows that e-learning is usually a source of anxiety. For example, Tuncay & Uzunboylu (2010) examined student’s anxiety and resistance during e-learning, finding that they face computer anxiety, internet anxiety, communicating in virtual groups anxiety, and online exam anxiety. Cadamuro et al. (2021) concluded that in the setting of e-learning, females are more susceptible and experience more anxiety during the procedure. They claimed that interactive activities minimize anxiety when compared to traditional lessons. Saadé et al. (2017) also found that the students feel worried during the online class. Pavlakis and Kaitelidou (2012) also found that e-learning is a great source of anxiety.

Fawaz and Samaha (2021) found that depression and anxiety problems have risen as a result of online learning. Goncharova et al. (2022) found that the majority of participants expressed unfavorable feelings about studying and teaching in a computer-mediated setting. The study's findings revealed that, while most of the students did not report psychological symptoms, they began to feel moderate degrees of anxiety as a result of the circumstance. Moreover, there was shown to be a substantial association between students' satisfaction with e-learning and the incidence of depression, anxiety, and stress symptoms, while satisfaction was also shown to be a predictor.

Lazarevic and Bentz’s (2021) on the other hand, found that research participants in a typical face-to-face classroom situation were slightly more anxious than those who took the course online. García-González et al. (2021) also found that e-learning offers advantages. However, many topics, particularly

those involving practical issues, are significantly more difficult to provide online. They also found that the abrupt transition to only e-learning instructional techniques has increased anxiety among students, particularly those in their final academic year.

Comparative studies between high school students with normal development and special educational needs

Literature shows that there are not many studies regarding the age group of students in high school, that compare students with and without special educational needs, but there are a few interesting findings. For example, Becker et al. (2020) studied online learning practices and challenges during first lockdown orders in teenagers with and without attention-deficit/hyperactivity disorder (ADHD) during the COVID-19 pandemic. Students with ADHD reported fewer routines and more distant learning issues than non-ADHD students.

The study conducted by Lavigne-Cervan et al. (2021) examined the effects of confinement during COVID-19 lockdown on state anxiety and executive functioning characteristics during an online educational modality period. According to the findings, adolescents had moderate–high levels of anxiety. In terms of gender, females had higher levels of anxiety and lower levels of executive functioning. Kalman-Halevi et al. (2021) examined the emotional costs and well-being of students with learning difficulties (LD) and ADHD who were introduced to e-learning courses during pandemic. The findings suggest that students with LD and/or ADHD have much greater levels of stress, anxiety, and depression than students without LD and/or ADHD, and have significantly lower levels of well-being. If the students had prior experience with online learning prior to the pandemic outbreak, there were no significant differences in emotional costs and well-being between those groups. Tessarollo et al. (2021) found that students with ADHD had a worse attention span, spontaneous commitment, and autonomy in remote learning.

Conclusions

The main objective of the present literature review was to investigate the issue of anxiety as consequence from e-learning in high school students with special educational needs. Studying the literature reveals that not many comparative studies have been implemented for e-learning in the age category of high school students. Most studies are about college students of higher education (e.g. Richardson, 2014; Richardson, 2015; Richardson, 2017; Cole, 2019; Zhang et al. 2020; Scott & Aquino, 2020; Dianito et al., 2021; Gin et al., 2021 etc), but there are a few interesting findings for the age group of high school students. The results indicate that high school students with special educational needs have more e-learning issues (Becker et al., 2020), higher levels of anxiety (Lavigne-Cervan et al., 2021; Halevi et al., 2021), stress, depression, lower levels of well-being (Halevi et al., 2021) and worse attention span, spontaneous commitment, and autonomy (Tessarollo et al., 2021), than students of typical growth. Research data, however, are limited and further investigation is needed in the future.

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